U.S. Department of the Interior

Bureau of Reclamation

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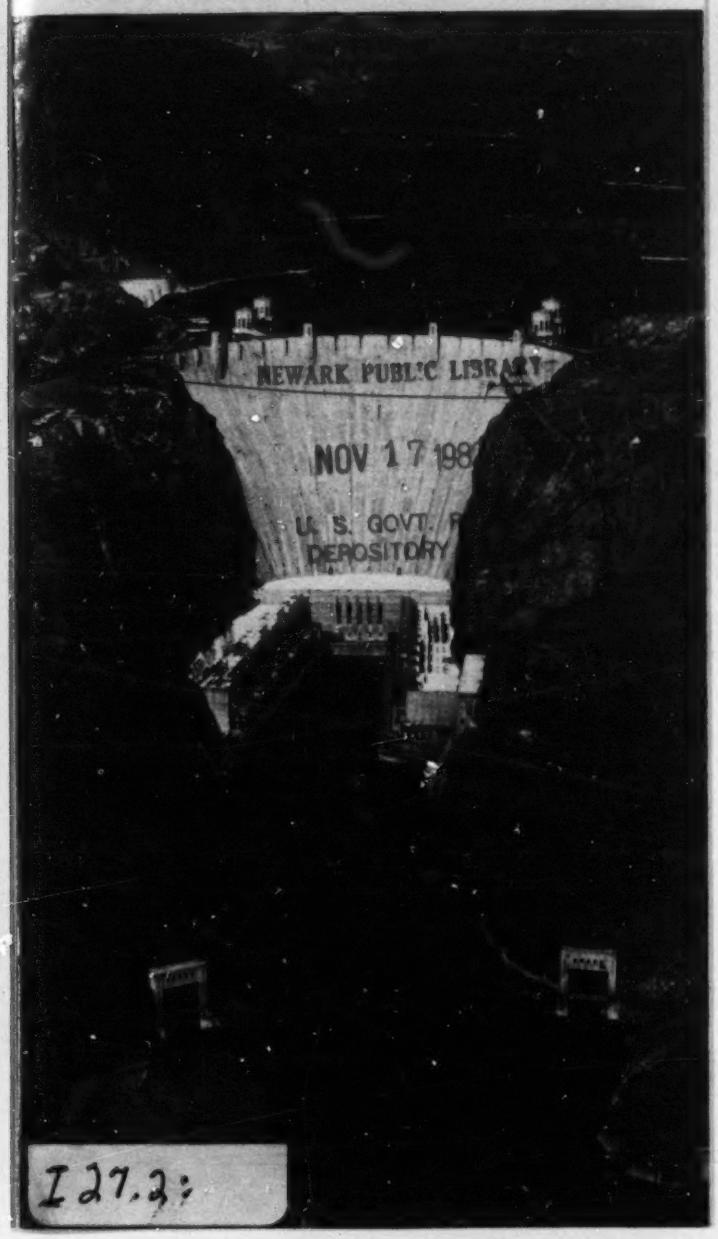
Hoover Dam



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History

For millions of years the Colorado River has left its mark on the land. Since the river was formed, it has been hard at work cutting great chasms such as the Grand Canyon as it carved its 1,400-mile course from Colorado's Rocky Mountains to the Gulf of California.

Early settlers along the Colorado tried to alter the river's impact on the land by diverting its waters for irrigation. But each year the Colorado, fed by melting snows in the spring and early summer, flooded low-lying lands along its route, destroying crops, lives, and property. In late summer and early fall, the river often dried to a trickle, too low to divert. Without water, crops and livestock withered and died.

The cycle of either too much or too little water limited the river's usefulness. To protect the low-lying valleys from flooding, and to assure a stable, year-round water supply, the river had to be tamed. A disastrous flood in California's Imperial Valley which occurred when the river changed its course in 1905 provided additional incentive for its control and regulation.

The flood occurred when early spring flash floods bolstered a normally high spring runoff. These high flows washed away small earth dams which had been constructed in a temporary channel cut for the purpose of diverting water from the river to the Imperial Canal. This canal ran through Mexico on its way to the Imperial Valley. As the heavy flows deepened the channel, the river changed course and began flowing into the Imperial Valley and the Salton Sea.

The river flowed into the valley for 16 months before it was returned to its original course. In that time, it destroyed homes and crops; heavily damaged highways, railroads, and irrigation works; and increased the size of the Salton Sea from 22 to 500 square miles.

Before the river could be harnessed, its waters had to be equitably divided among the seven states it serves. In January of 1922, representatives of these states met to seek agreement on their respective rights to the river's waters. In November of that year, the members of this Colorado River Commission met in Santa Fe, New Mexico, and signed the Colorado River Compact. This agreement divided use of the water between the Upper and Lower Colorado River Basins. It also paved the way for construction of works to control, regulate, and use the river. Six years later, in 1928, Congress passed the Boulder Canyon Project Act, authorizing construction of Hoover Dam and the All-American Canal System, which carries water to thirsty lands in California and Arizona.

Construction of Hoover Dam began in 1931, and the last concrete was poured in 1935 — 2 years ahead of schedule. President Franklin D. Roosevelt dedicated the dam on September 30, 1935.

The powerplant structures were completed in 1936, and the first generator began commercial operation in October of that year. The 17th and final generator went into commercial operation in 1961.

The dam was originally named for Herbert Hoover, 31st President of the United States. For a time, the names Boulder Canyon Dam and Boulder Dam were used, but the original name was restored by Congressional action in 1947.

Hoover Dam is the key to control and regulation of the lower Colorado River. There has never been a flood or drought on the lands served by the river since Hoover Dam began storing water.

Engineering Wonder

Hoover Dam, Reclamation's pioneer multipurpose project on the Colorado River, is located in Black Canyon between Nevada and Arizona. In 1955, the American Society of Civil Engineers selected Hoover as one of our country's Seven Modern Civil Engineering Wonders. A bronze plaque citing this honor is located near the roadway at the center of the dam.

Hoover Dam was without precedent, the greatest dam constructed in its day. An arch gravity structure rising 726 feet above bedrock, Hoover is still the Western Hemisphere's highest concrete dam. It is 660 feet thick at its base, 45 feet thick at its crest, and stretches 1,244 feet across Black Canyon. There are 4.4 million cubic yards of concrete in the dam, powerplant, and related structures.

The reservoir, Lake Mead, is America's largest man-made reservoir. Named for Dr. Elwood Mead, Reclamation Commissioner during Hoover's construction, the lake backs up 110 miles behind the dam and is capable of storing 28.5 million acre-feet of water. (An acre-foot of water is 325,851 gallons, or enough to cover an acre to a depth of one foot.)

With a nameplate capacity of 1,344,800 kilowatts, Hoover Powerplant is one of this country's largest hydroelectric installations.

Multipurpose Benefits

Hoover Dam pioneered the Bureau of Reclamation's efforts in multiple-purpose water resources development. The dam controls floods; stores water for irrigation, municipal, and industrial uses; and provides hydroelectric power generation, recreation, and fish and wildlife habitat.

Hoover Dam's reservoir, Lake Mead, can store nearly 2 years of average Colorado River flow. This water is released in a regulated, year-round flow to downstream farms, homes, and factories.

Water stored in Lake Mead irrigates three-quarters of a million acres of land in this country and nearly one-half million acres in Mexico. The water helps meet the municipal and industrial needs of over 12 million people.

As it passes through Hoover's turbines, the water generates low-cost hydroelectric power for use in Nevada, Arizona, and California. About 4 billion kilowatt-hours of energy, enough for 500,000 homes, are generated annually.

Water that was once muddy is now sparkling clear in reservoirs and in stretches of the river. Hoover and other dams on the Colorado have tamed the turbulent flow, creating clean bodies of water that provide recreation for more than 10 million people each year. These waters have also formed habitats for fish and wildlife in lands that were once nearly barren.

Hoover Dam changed the Colorado River from a natural menace to a national resource, strengthening the economy of the Pacific Southwest and the Nation.

Farms

Colorado River water stored behind Hoover Dam irrigates some of America's richest farmlands. Valley and mesa lands in the warm desert climate along the river grow a wide variety of fruits, vegetables, and other nonsurplus crops throughout the year for the Nation's dinner tables.

Yearly gross income from these crops averages hundreds of dollars per acre. In 1980, for example, the total gross crop value in the Coachella and Imperial Valleys was nearly $560 million, or over $1,000 per irrigated acre.

Major irrigation projects which benefit from Hoover's control and regulation of the Colorado River include the Palo Verde Valley, the Colorado River Indian Reservation, the Yuma and Gila Projects in Arizona, and the Imperial and Coachella Valleys in California.

The All-American Canal System diverts water from the Colorado River at Imperial Dam. When the water reaches the farthest point on the system, it has traveled 10 days and some 500 miles from Lake Mead.

Energy

From 1939 to 1949, Hoover Powerplant was the world's largest hydroelectric installation. It is still one of this country's largest facilities. With 17 generating units and two station service units, the plant has a nameplate capacity of 1,344,800 kilowatts.

Hydroelectric power is created as water rushes through turbines that activate generators. When the water has completed its task, it flows on unchanged to serve other needs. The electricity produced is clean, nonpolluting, and, unlike many other forms of energy, renewable.

Through the sale of power and water, a major portion of the money used to construct Reclamation projects is returned to the Federal Treasury. Hoover Dam's approximately $175 million cost is being repaid over a 50-year period, with interest. However, $25 million of this amount is allocated to flood control costs, on which repayment has been deferred until 1987 when further action will be subject to Congressional direction. As of May 31, 1981, the project grossed approximately $454 million, with a net return to the Federal Treasury of over $215 million (operating costs deducted).

Hoover Dam energy is marketed by the U.S. Department of Energy's Western Area Power Administration to both public and private agencies under contracts which expire in 1987. This energy is allocated, by percentage as follows:

States of Arizona and Nevada	17.6259 percent each
Metropolitan Water District of Southern California	35.2517 percent
City of Burbank	0.5773 percent
City of Glendale	1.8475 percent
City of Pasadena	1.5847 percent
City of Los Angeles	17.5554 percent
Southern California Edison Company	7.9316 percent

The City of Los Angeles Department of Water and Power and the Southern California Edison Company operate Hoover Dam's generating equipment under contract as agents of the Federal Government.

Most of the generating units will be substantially overhauled during the 1980's. This will increase the rated capacity of each unit, raising the total plant capacity to about 1.8 million kilowatts.

Reclamation planners are also studying the feasibility of adding another powerhouse that could boost the total plant capacity to about 2.3 million kilowatts. This would increase the facility's capability to furnish power during peak demand periods.

Cities

By regulating the Colorado River, Hoover Dam assures a steady flow of municipal and industrial water to Los Angeles, San Diego, and other cities in the Pacific Southwest. Phoenix, Arizona, will be added to the list when the Central Arizona Project begins delivering water in 1985. The Tucson area is scheduled to receive project water in the late 1980's.

Parker Dam and its reservoir, Lake Havasu, are 155 miles downstream from Hoover Dam. Lake Havasu provides clear, desilted water for the Colorado River Aqueduct and will also serve the Central Arizona Project when it starts operation. Parker Dam was constructed with funds advanced by the Metropolitan Water District of Southern California.

Since 1941, the Colorado River Aqueduct has delivered water from Lake Havasu behind Parker Dam to the Los Angeles metropolitan area. The Colorado River Aqueduct is tapped by the San Diego Aqueduct, which takes water to that city's water system.

Part of the hydroelectric energy generated at Hoover and Parker Dams helps pump water along the Colorado River Aqueduct. The 242-mile-long aqueduct has an annual capacity of 1,212,000 acre-feet, or 1 billion gallons of water a day. Five pumping stations lift the water 1,617 feet over the mountains between the Colorado River and the coastal plain.

The Colorado River Aqueduct was also selected by the American Society of Civil Engineers as one of this Nation's Seven Modern Civil Engineering Wonders.

Homes and industries in the Las Vegas metropolitan area receive Colorado River water from Lake Mead. The first stage of the Southern Nevada Water Project has been delivering water to the area since 1971. In 1980, the project served nearly 442,000 people. The second stage of the project began water delivery in 1982.

Recreation, Fish, and Wildlife

Lake Mead is one of America's most popular recreation areas. A 12-month season attracts more than 5 million visitors each year for swimming, boating, skiing, and fishing.

Black and striped bass, bluegill, crappie, and catfish abound in the lake. There is no closed season, and anglers take large numbers of game fish each year.

The lake and surrounding area are administered by the National Park Service as part of the Lake Mead National Recreation Area. The area also includes Lake Mohave, which extends from Hoover Dam 67 miles downstream to Davis Dam.

The cold waters flowing into Lake Mohave, drawn from the depths of Lake Mead and stocked from the modern Willow Beach National Fish Hatchery, provide excellent trout fishing.

Lakes Mead and Mohave also provide sanctuary for many species of waterfowl and other types of birds. In addition, they serve as huge waterholes for mountain sheep and other wildlife living in the adjacent mountains and mesas.

Hoover Dam Film Available

A 28-minute, 16-mm color film, "The Story of Hoover Dam," is available upon request for schools, civic groups, clubs, other public gatherings, and television stations.

Prints may be ordered from the U.S. Department of the Interior, Bureau of Reclamation, Code D-922, PO Box 25007, Denver, Colorado 80225. There is no cost to the borrower except return postage.

The film tells the dramatic story of Hoover Dam's construction and its impact on life in the Pacific Southwest. It depicts the dam's construction, installation of the last generating unit, recreation on Lake Mead, and developments downstream.

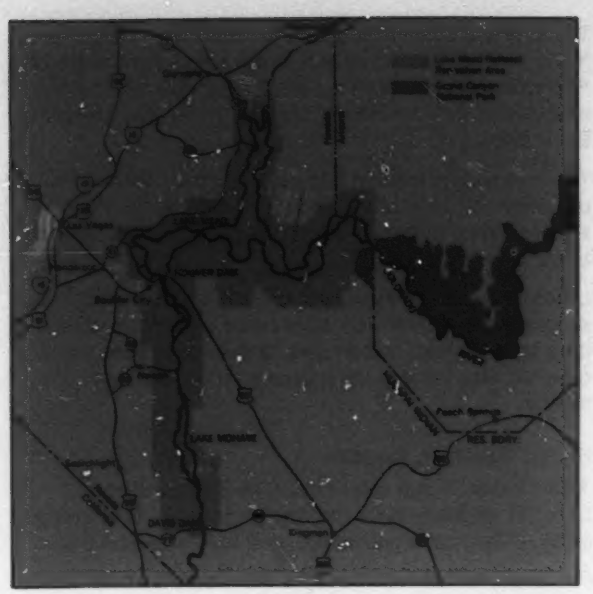
Guided Tours

Bureau of Reclamation guides conduct tours through Hoover Dam daily.

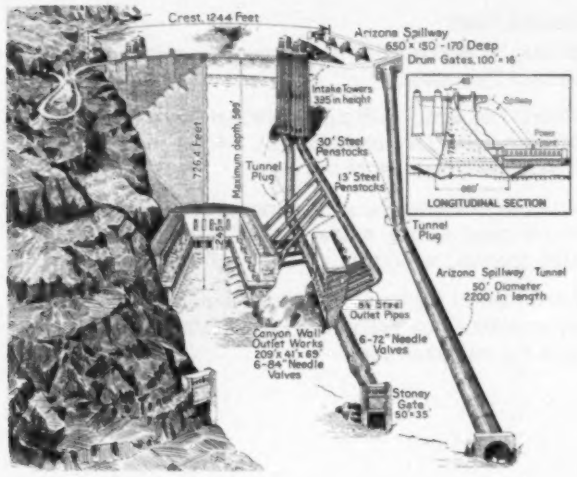
Hours: 7:30 a.m. - 7:15 p.m. Memorial Day weekend through Labor Day, and 8:30 a.m. - 4:15 p.m. daily during the remainder of the year.

An exhibit building housing a model of a generating unit and a topographical model of the Colorado River Basin is also open to the public.

More than 21 million visitors have toured the dam and powerplant since 1937. More than 600,000 people now take the tour each year.



Water is released from Lake Mead through similar sets of diversion works in both walls of Black Canyon. The water, drawn through the intake towers, flows through pipes called penstocks to the powerplants. The penstocks also can be used to discharge water directly from the reservoir to the river below the dam. The spillways have been used only once, when they were successfully tested in 1941.



Physical Data

The Dam

It is	726.4 feet or 221.28 meters high
Its crest is	1,244 feet or 379.2 meters long
At top it is	45 feet or 13.7 meters thick
At bottom it is	660 feet or 201.2 meters thick

It contains 3¼ million cubic yards or 2½ million cubic meters of concrete.

The Reservoir

Lake Mead when full is 110 miles or 177 kilometers long and has an 822-mile or 1323-kilometer shoreline. Its capacity, including dead storage, is 28,537,000 acre-feet or 35,200,000,000 cubic meters.

Its maximum depth is	500 feet or 152 meters
It covers	157,900 acres or 63,900 hectares

All figures are for the reservoir filled to the top of the spillway gates in the raised position — elevation 1221.4 feet or 372.28 meters.

The Powerplant

Its capacity is 1,344,800 kilowatts

Its 17 large generators are rated at:

One	95,000 kilowatts
Fourteen	82,500 kilowatts each
One	50,000 kilowatts
One	40,000 kilowatts

Each of its two station service generators is rated at 2,400 kilowatts.

Its 17 large turbines are rated at:

Fifteen	115,000 horsepower each
One	70,000 horsepower
One	55,000 horsepower

Each of its two station turbines is rated at 3,500 horsepower.

As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interests of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

* U.S. Government Printing Office: 1982-579-675

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